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1971 OPERATING SUMMARY

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PORT DOVER

WATER POLLUTION CONTROL PLANT

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Port Dover : water pollution
control plant.
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Water management in Ontario

Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in this summary.

DS Caverly
D.S. Caverly,
General Manager.

D McTavish
D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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135 St. Clair Avenue West
Toronto 195

PORT DOVER

WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF PORT DOVER

by the

ONTARIO WATER RESOURCES COMMISSION

1971 ANNUAL OPERATING SUMMARY

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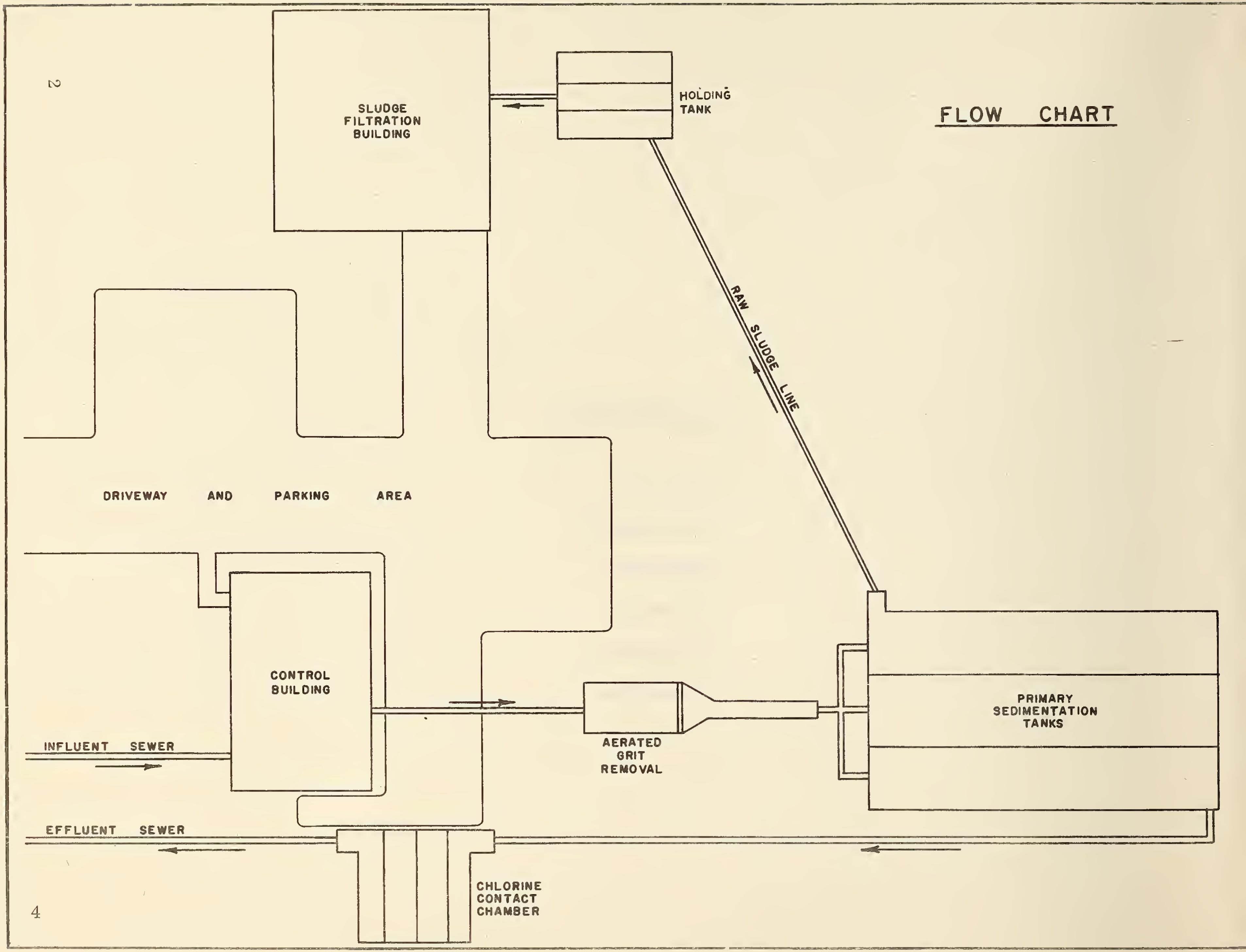
FLOW CHART


SLUDGE FILTRATION BUILDING
HOLDING TANK
RAW SLUDGE LINE
DRIVEWAY AND PARKING AREA
CONTROL BUILDING
INFLUENT SEWER
AERATED GRIT REMOVAL
PRIMARY SEDIMENTATION TANKS
EFFLUENT SEWER
CHLORINE CONTACT CHAMBER

DESIGN DATA

PROJECT NO.	2-0115-62
TREATMENT	Primary
DESIGN FLOW	2.1 mgd
DESIGN POPULATION	5,300
BOD - Raw Sewage	210 mg/l
- Removal	30%
SS - Raw Sewage	296 mg/l
- Removal	60%

RAW SEWAGE PUMPS

Type: Worthington
Size: One 800 gpm @ 24' tdh
One 500 gpm @ 24' tdh
Two 1750 gpm @ 25' tdh

PRIMARY TREATMENT

Grit Removal

Type: Aerated, mechanical grit collector (Rex Chainbelt)
Size: One 20' x 10' x 11.85' (14,750 gal)
Retention: 10 min

Air Supply

Type: Roots-Connersville
Size: Two 130 scfm

Primary Sedimentation

Type: Rex Chainbelt
Size: Three 75' x 15' x 8' (168,000 gal)
Retention: 1.93 hr
Loading: Surface, 620 gal/ft^2/day
Weir, 46,500 gal/ft/day

CHLORINATION

F & P automatic

Chlorine Contact Chamber

Size: One $21\frac{1}{2}$' x 18' x $6\frac{1}{2}$' (15,950 gal)
Retention: 11 min

OUTFALL

to Lake Erie

SLUDGE HANDLING

Aerated holding tank, one 20' x 15' x 8.2' (avg)
Size: 2,460 ft^3 or 12,750 gal

Vacuum Filter

Type: Eimco (cloth)
Size: One 200 sq ft

PUMPS -- TYPE and SIZE

#1 Pumping Station (custom-built)

Type: Worthington
Size: Three 1750 gpm @ 66' tdh (station has one Barminutor, Model C)

#2 Pumping Station (prefabricated)

Type: Fairbanks-Morse
Size: Two 417 gpm @ 48' tdh

#3 Pumping Station (prefabricated)

Type: Fairbanks-Morse
Size: Two 207 gpm @ 65' tdh

#4 Pumping Station

Type: Flygt submersible
Size: Two 217 gpm @ 19' tdh

NOTE: Above pumping stations have overflows to Lynn River

'71 Review

GENERAL

The Port Dover Water Pollution Control Plant is a 2.10 mgd primary treatment plant consisting of screening facilities, an on-site pumping station, aerated grit removal, primary settling, chlorination, raw sludge storage and vacuum filtration. There are four remote pumping stations, two of which are prefabricated, one submersible and one custom-built. The latter has screens, barminution and chlorination facilities. The project is operated and maintained by a chief operator and an operator. During 1971 there were no major operating problems.

Procedures to expand the sewer collection system continued throughout the year.

EXPENDITURES

The total operating cost for the year was $29,330.41 or $260.22 per million gallons of sewage treated. The unit cost of treating one pound of BOD decreased to 21 cents.

PLANT FLOWS and CHLORINATION

The total flow treated in 1971 was 122.71 million gallons or 16 percent of design capacity.

Disinfection of the final effluent by chlorination is practised from April through October to avoid danger to public health from recreational use of the receiving water. The total 1971 chlorine consumption decreased slightly due to corresponding decreases in BOD loading.

PLANT EFFICIENCY

The average BOD and suspended solids concentration at the influent were 196 mg/l and 358 mg/l respectively. Effluent BOD and suspended solids were 81 mg/l and 75 mg/l respectively. The removal efficiencies for BOD and suspended solids were 59 and 75 percent, well above average for a primary plant.

Grit removal amounted to 1.55 cubic feet per million gallons, less than last year but within the normal range for sanitary sewage.

VACUUM FILTRATION

Two types of chemicals were used in sludge vacuum filtration. Polyelectrolytes were used in filtering a total of 37.6 tons of dry solids, while lime and ferric chloride were used in filtering an additional 29.8 tons. The average yield of 5.4 pounds of dry sludge per square foot of filter area is considered normal for this operation. Chemical requirements of the sludge are lower than normal, with polyelectrolytes at 543 ppm, lime at 7 percent and ferric chloride at 3.3 percent. This beneficial effect can be attributed to industrial wastes.

CONCLUSIONS

During 1971, plant efficiency again exceeded normal expectations for a primary treatment plant. However, the effluent did not meet the OWRC effluent objective of 15 mg/l for both BOD and suspended solids.

The use of polyelectrolytes for vacuum filtration of sludge, when possible, again produced a substantial unit cost reduction.

PROJECT COSTS

NET CAPITAL COST (Final)	$684, 451.08
DEDUCT - Portion financed by CMHC/MDLB (Final)	463, 731.87
Long Term Debt to OWRC	$220, 719.21
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	$ 41, 117.83

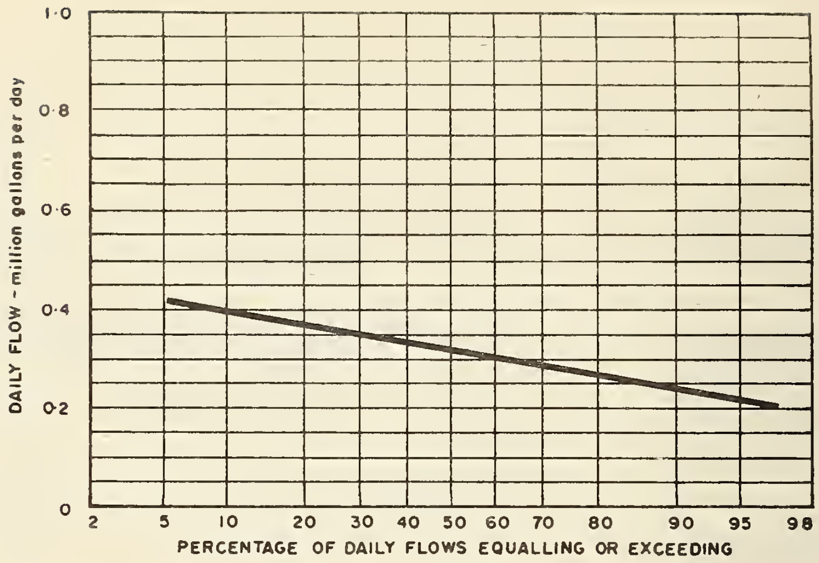
Net Operating	$ 29, 330.41
Debt Retirement	2, 336.00
Reserve	3, 063.58
Interest Charged	12, 380.32
TOTAL	$ 47, 110.31

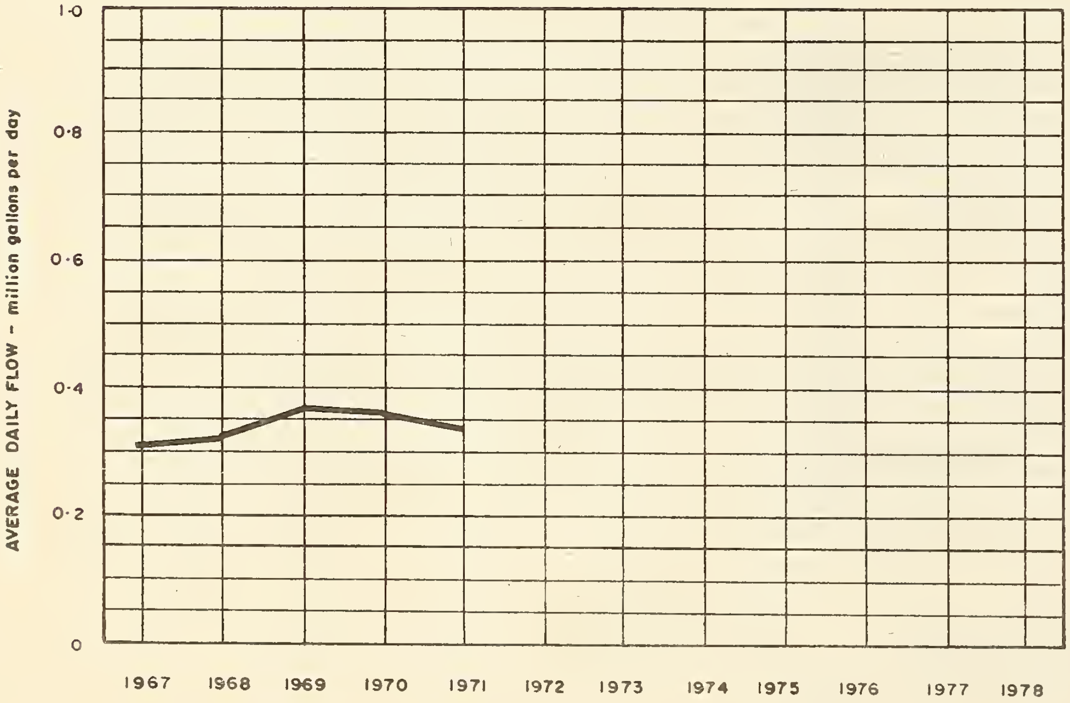
RESERVE ACCOUNT

Balance @ January 1, 1971	$ 32, 969.42
Deposited by Municipality	3, 063.58
Interest Earned	2, 206.08
	$ 38, 239.08
Less Expenditures	-
Balance @ December 31, 1971	$ 38, 239.08

PROCESS DATA

FLOWS



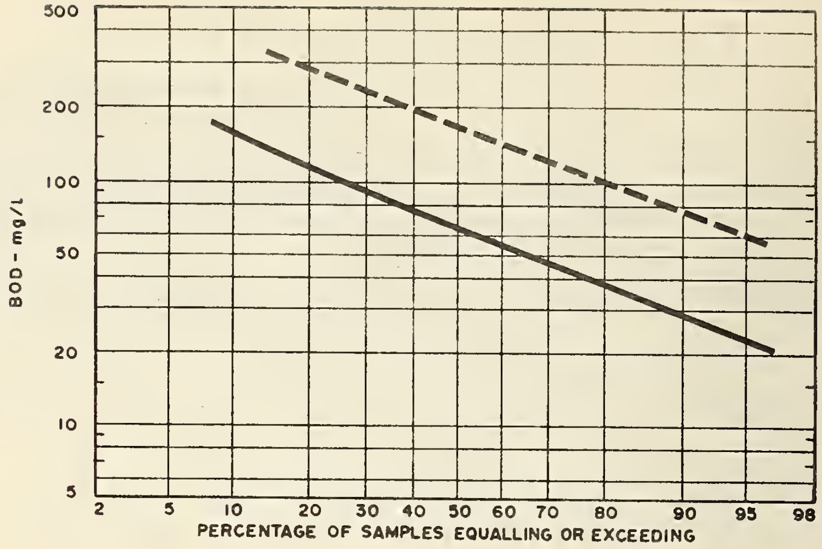


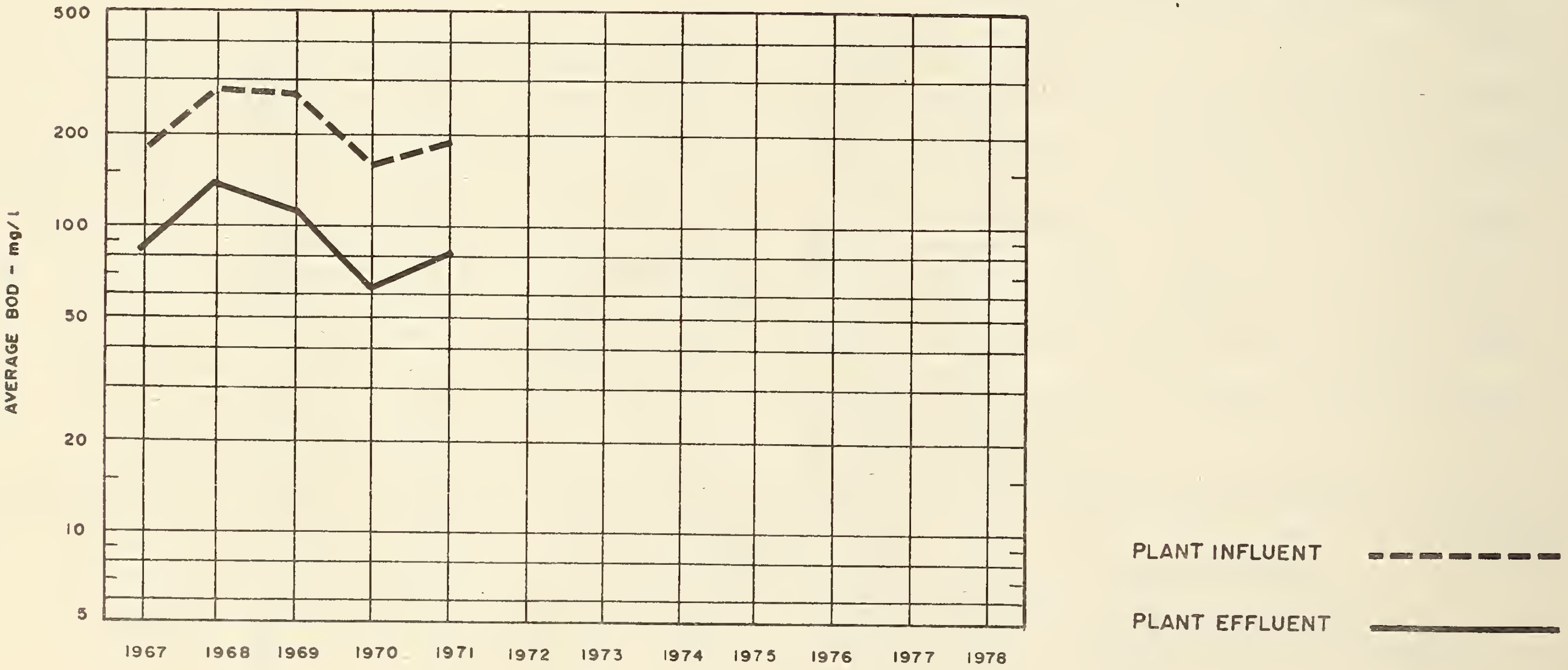
DESIGN CAPACITY 2.1 MGD

PLANT PERFORMANCE

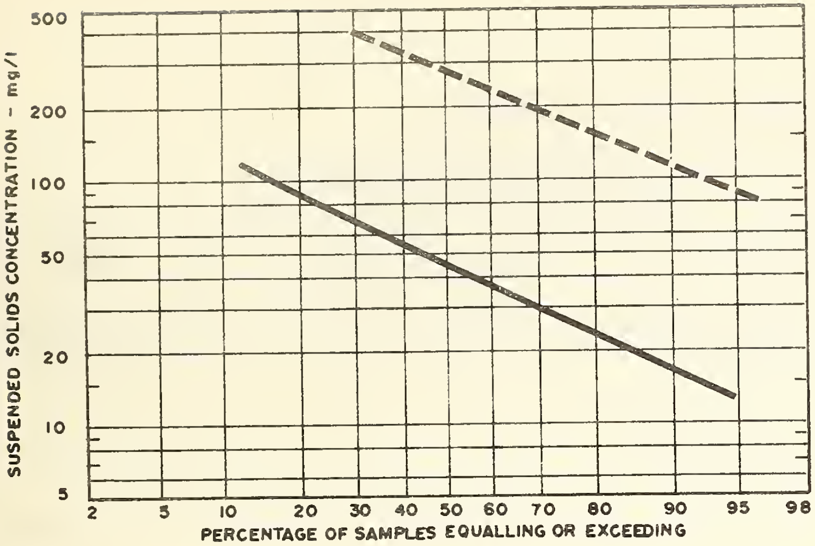
MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	RED$^{\underline{n}}$
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l as P	mg/l as P	%
JAN	8.93	.29	.51	1.0	135	37	73	9	244	41	83	18	7.5	4.2	44
FEB	10.07	.36	1.18	1.5	65	45	31	2	210	37	82	17	4.2	3.8	10
MAR	14.53	.46	.94	2.0	75	23	69	8	285	22	92	38	2.3	2.9	0
APR	12.10	.40	.72	1.5	83	34	59	6	234	35	85	24	7.6	4.2	45
MAY	10.44	.34	.47	1.5	185	60	68	13	275	40	87	24	9.1	5.0	45
JUNE	10.51	.34	.56	2.0	120	60	50	6	224	37	83	20	11.0	4.9	55
JULY	10.54	.34	.45	1.0	90	47	48	4	329	40	88	30	7.4	3.9	47
AUG	9.14	.30	.37	2.0	280	80	71	18	529	82	84	41	7.8	5.1	35
SEPT	8.40	.28	.39	2.0	375	166	56	18	666	224	66	37	10.0	5.8	42
OCT	8.42	.27	.39	1.5	242	128	47	10	359	94	74	22	9.0	5.9	34
NOV	8.63	.29	.58	1.0	220	70	68	13	285	61	79	19	7.8	4.4	44
DEC	11.00	.37	.64	1.3	160	38	76	13	312	55	82	28	6.5	3.4	48
TOTAL	122.71	–	–	–	–	–	–	120	–	–	–	318	–	–	–
AVG.	–	.33	MAXIMUM 1.18	MAXIMUM 2.0	196	81	59	10	358	75	79	27	7.6	4.5	41
No. of Samples	–	–	–	–	24	24	–	–	174	170	–	–	22	22	–

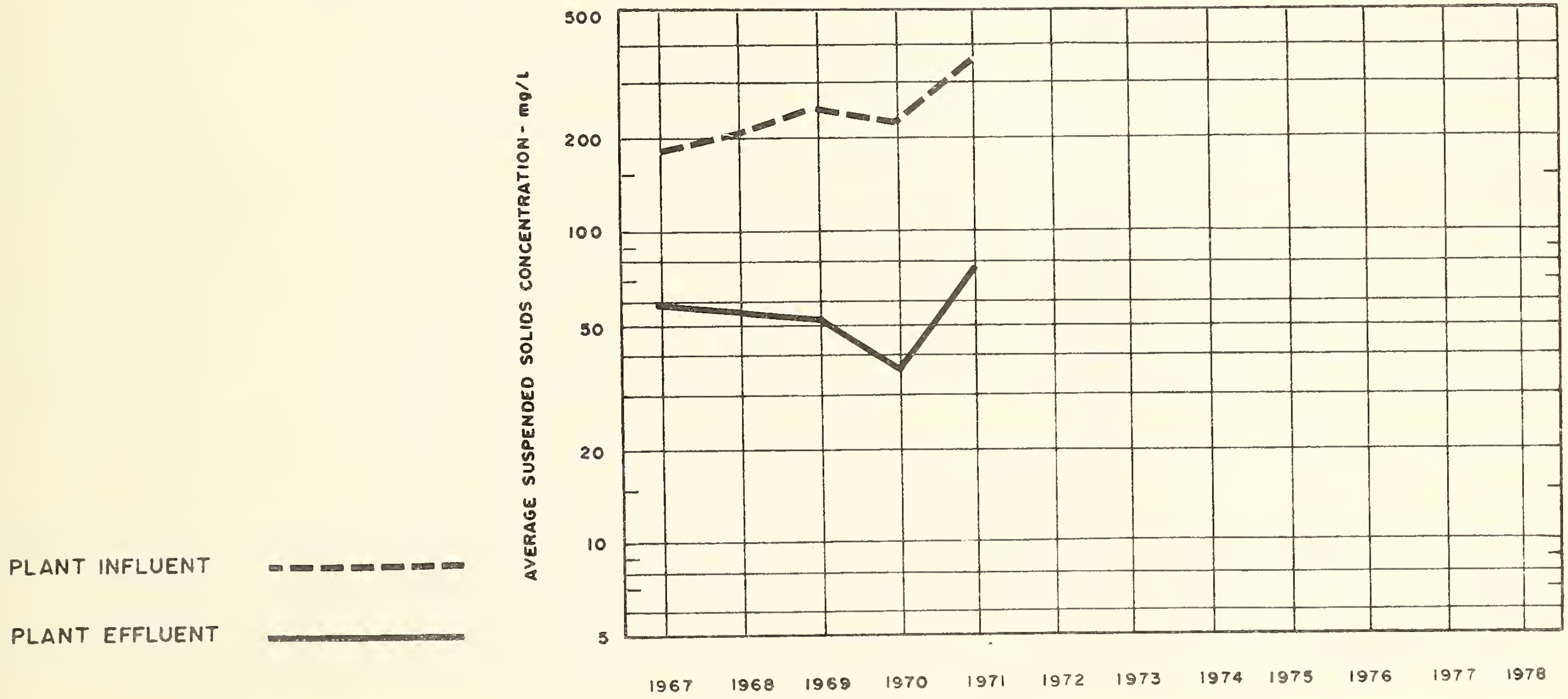
BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS





TREATMENT DATA

MONTH	GRIT	CHLORINATION		VACUUM FILTER OPERATION										
					SLUDGE TO FILTER			CONDITIONING CHEMICALS USED AS CONCENTRATE				FILTER CAKE		
	QUANTITY REMOVED cubic feet	Cl_2 USED pounds	AVG. DOSE mg/l	IN USE hours	QUANTITY 10^3 gallons	% TS	DRY SOLIDS lb	CaO lb	$FeCl_3$ lb	$Fe_2(SO_4)_3$ lb	Polymer lb	YIELD LB/FT^2 PER HR	% TS	HAULED CU YD
JAN	0	0	-	9.0	11.2	5.3	5.9	0	0	0	3.5	3.3	25	21
FEB	54	0	-	7.5	11.7	5.4	6.3				2.5	4.2	22	21
MAR	0	0	-	5.5	8.5	5.9	5.0	0	0	0	.5	4.6	20	18
APR	12	548	7.9	5.5	9.7	8.0	7.7	0	0	0	0	7.0	22	18
MAY	15	1027	9.8	6.5	11.7	6.8	8.1	0	0	0	.5	6.2	24	25
JUNE	27	775	7.4	7.5	11.2	13.5	15.2	0	0	0	2.0	10.1	24	26
JULY	0	1397	13.3	8.0	21.6	8.7	18.5	525	0	10	4.0	5.7	24	45
AUG	0	1318	14.4	10.5	10.8	8.0	8.6	455	0	90	8.0	4.1	22	27
SEPT	54	1501	17.9	18.5	34.1	7.8	26.2	1410	819	0	0	7.0	27	68
OCT	28	1051	12.5	6.0	7.9	7.8	6.2	385	191	0	0	5.1	27	18
NOV	0	20	7.4	13.0	14.0	8.6	12.0	910	464	0	0	4.6	26	36
DEC	0	0	-	20.5	21.7	7.2	15.2	745	491	0	8.0	3.7	24	46
TOTAL	190	7637	-	118.0	174.1	-	134.9	4630	1965	100	29.0	-	-	369
AVG. X	1.55 cu.ft/mil gal	1091	12.0	9.8	14.5	7.8	11.2	DOSE % 7.0	DOSE % 3.3	DOSE % 1.2	DOSE PPM 543	5.4	24	31

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Ontario Water Resources Commission
Division of Plant Operations.

Port Dover water pollution control
lant. Annual Reports. 1971

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